

**12 APRILE 2022  
10:00 – 12:00**

«La Blue Bioeconomy  
nell'area  
mediterranea:  
strategie  
e opportunità  
d'innovazione per le  
regioni italiane»



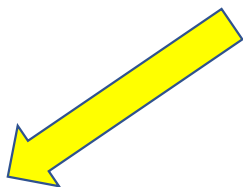
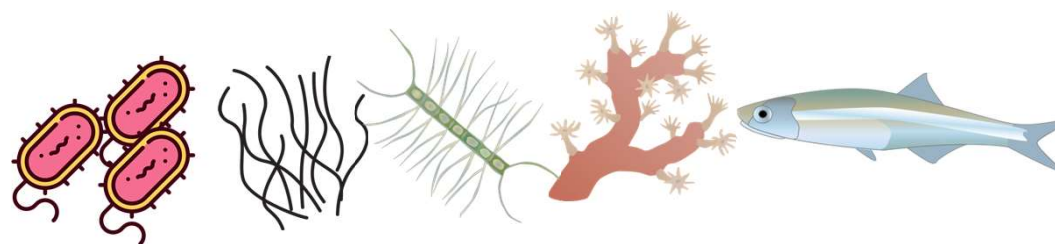
**Technology and market trends su  
Blue Biotechnology e Blue  
Sustainable Development**

**Mauro Celussi – Ricercatore in  
ecologia marina, OGS**



## II. THE BLUE BIOTECHNOLOGY SECTOR

## SEA ORGANISMS' GENETICS



### Gene search:

- Known, specific genes
- Whole genome sequencing / Metagenomes

### Applications:

- Drugs/additives
- Plastic degradation
- Bioremediation
- Aquaculture

## 5.c PLAYERS TO BE MONITORED

- ALGENTECH ([Algentech – Plant Gene Technology](#))
- GENOBIOTECH COMPANY ([Genobiotech Co., Ltd. - Company Profile \(ec21.com\)](#))
- CHROMAXOME CORPORATION ([www.inknowvation.com | ...realizing the value of SBIR-STTR technologies and capabilities](#))

### NOTE:

*Although there is a growing interest in genetics-based biotechnology Companies specifically designed to work on Marine Organisms are not so widespread*





Figure 66 Sea organisms' genetics: Ranking of the country of residence of the players based on the patent family dimension

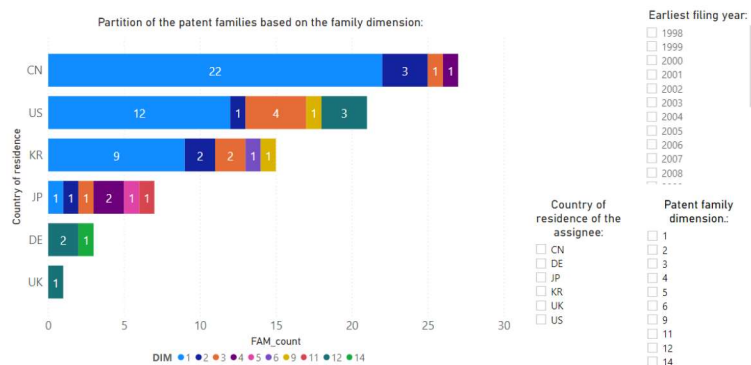
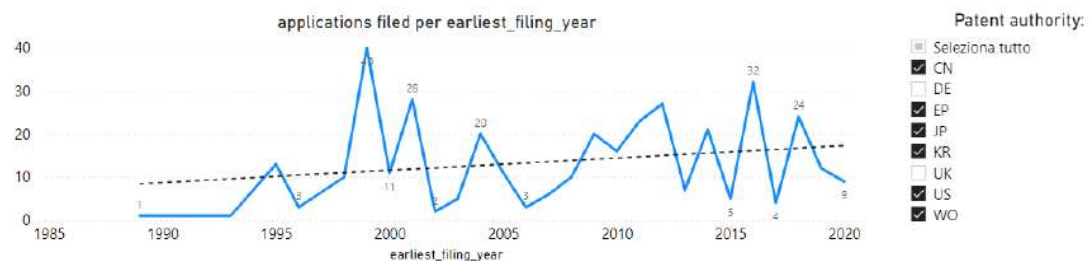


Figure 27 Sea organisms' genetics: Normalization of patent applications



## Technologies investigated in the TF

Sea Organisms Genetics

Patent trends

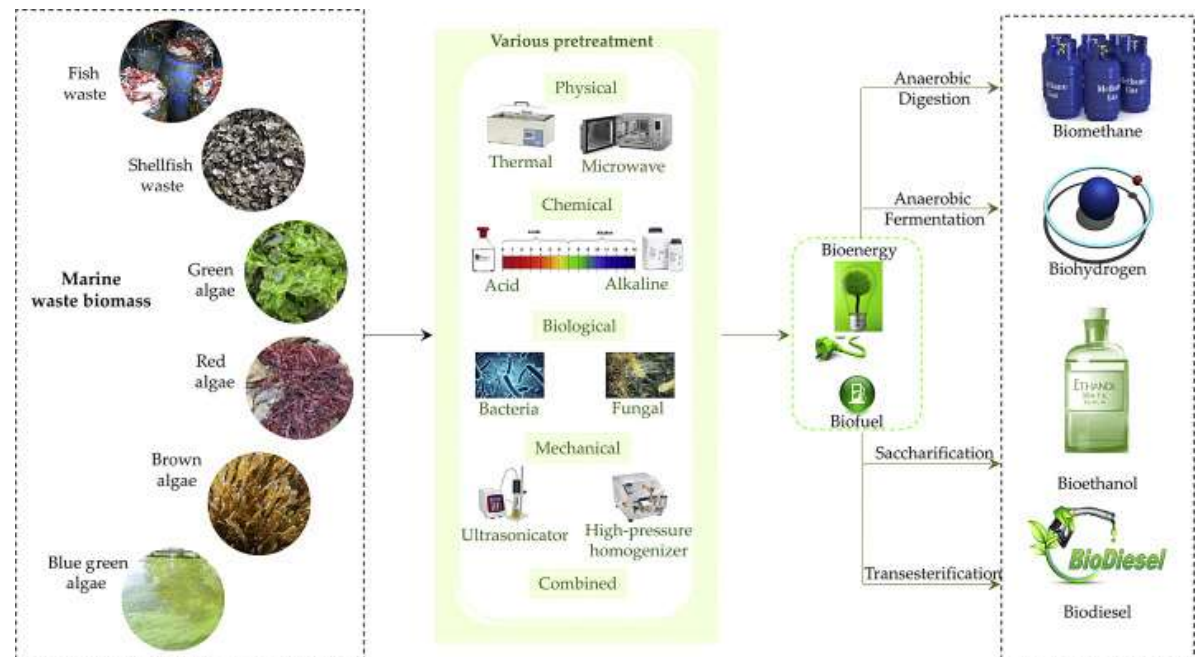


Market trends





## BIOFUELS



## 5.d PLAYERS TO BE MONITORED

- HELIAE DEVELOPMENT ( [Heliae Development - Sustainable & Regenerative Agriculture Solutions \(heliae-global.com\)](http://heliae-global.com))
- KIVERDI ([Kiverdi, Inc.](http://kiverdi.com))
- ENN RESEARCH INSTITUTE ([enn energy research institute \(ennresearch.com\)](http://ennresearch.com))
- ADVANCED BIOMASS R&D CENTER ([Advanced Biomass R&D Center](http://advancedbiomass.com))
- KOREA INSTITUTE OF ENERGY RESEARCH ([KOREA INSTITUTE OF ENERGY RESEARCH \(kier.re.kr\)](http://kier.re.kr))
- SOLAZYME ([Solazyme | At Solazyme we transform microalgae, the smallest of organisms, into solutions for the worlds biggest problems. \(solazymeindustrials.com\)](http://solazyme.com))
- NESTE OIL ([Products | Neste](http://products.neste.com))



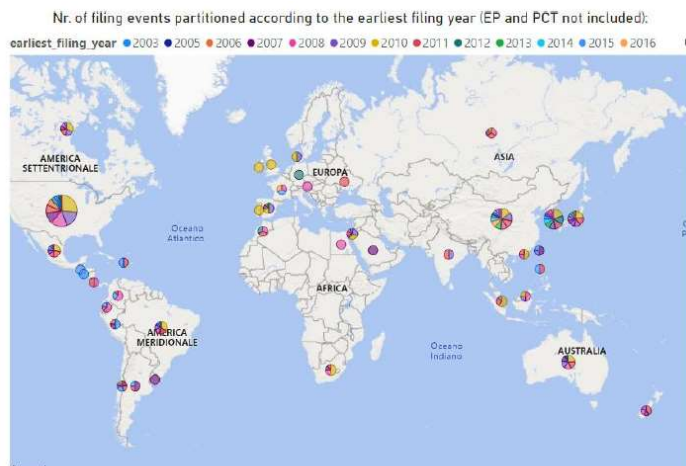


Figure 70 Biofuels: Ranking of the country of residence of the players based on the patent family dimension

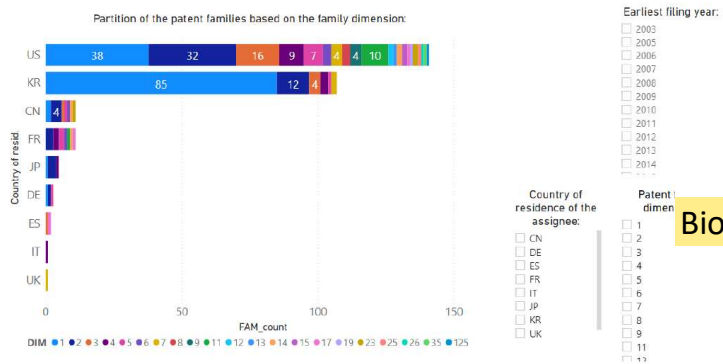
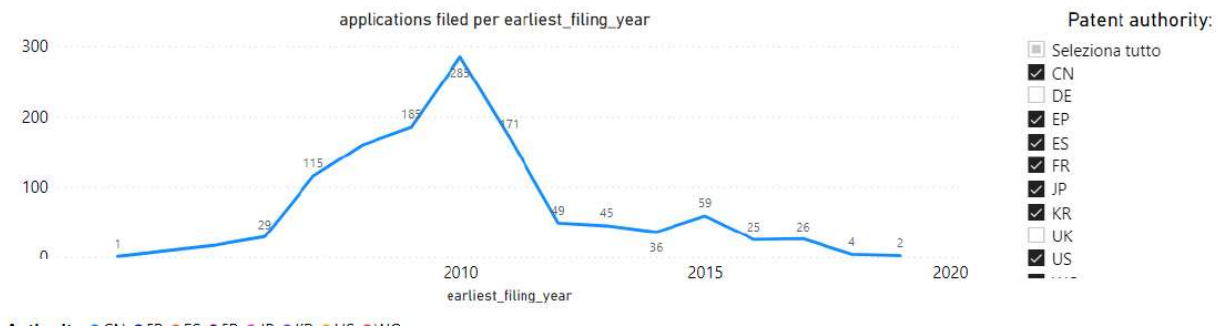


Figure 33 Biofuels: Normalization of patent applications



## Technologies investigated in the TF

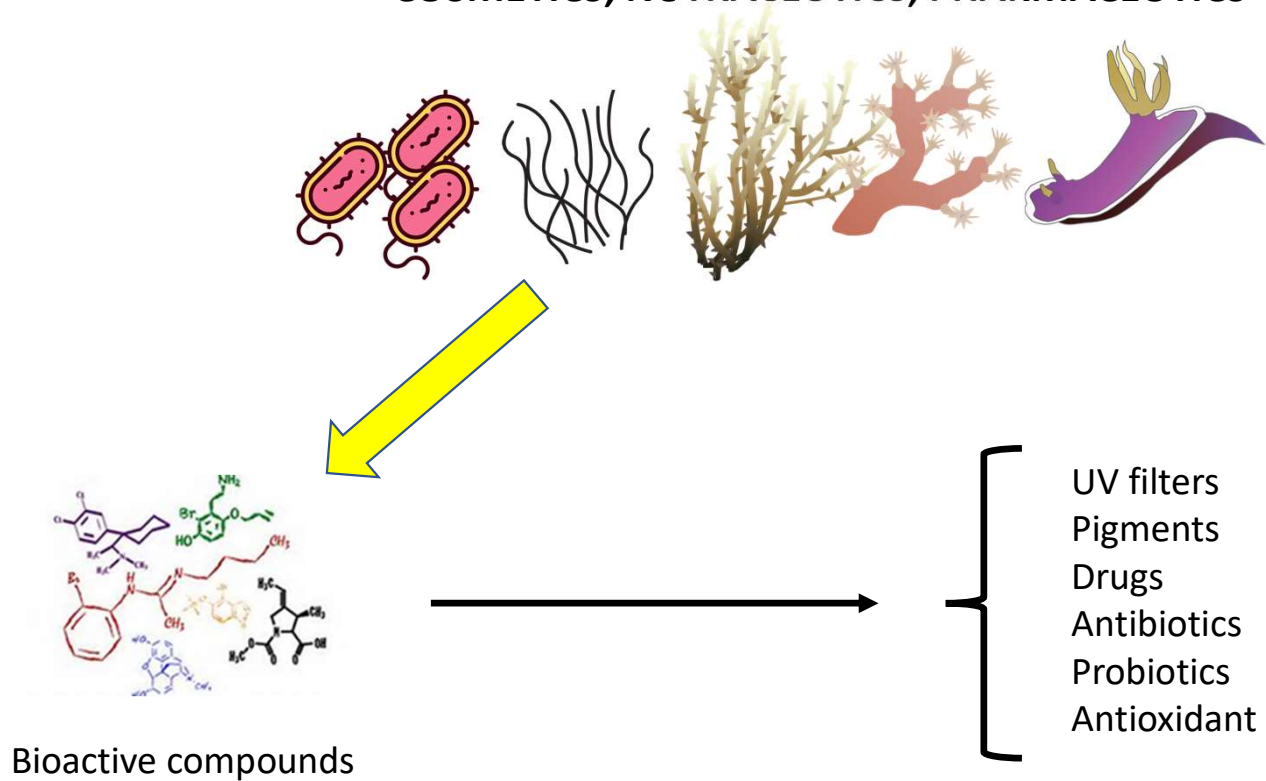
Biofuels

Patent trends  
↓

Market trends  
↑



## COSMETICS, NUTRACEUTICS, PHARMACEUTICS



## 5.a PLAYERS TO BE MONITORED

- FITOPLANKTON MARINO ([Fitoplancton Marino - Home](#))
- GREENALTEC S.L. ([GREENALTECH - Biotechnology by Greenaltech. Improving healthspan and wellbeing.](#))
- GELYMA ([Gelyma](#))
- L'OREAL ([L'Oréal, world leader in beauty : makeup, cosmetics, haircare, perfume \(loreal.com\)](#))
- FERMENTALG ([Home - Fermentalg - Algae you can trust](#))
- BIOTECHMARINE ([BiotechMarine | SEPPIC](#))
- ALGAHEALTH ([AlgaHealth –Fucoxantin from microalgae – \(alga-health.com\)](#))
- CUTECH ([Screening Services - Cutech](#))
- SIGEA ([SIGEA - Mastering and Creating](#))
- ARC MEDICAL DEVICES ([ARC Medical Devices Inc. |](#))
- TAIYO KAGAKU COMPANY ([TAIYO \(taiyokagaku.com\)](#))
- HELIAE DEVELOPMENT ([Heliae Development - Sustainable & Regenerative Agriculture Solutions](#))
- TAKARA BIO ([Takara Bio—Home](#))
- METABOLIUM ([Metabolium : Compléments alimentaires innovants, 100% naturels](#))

## EXAMPLES

Among the players to be monitored FERMENTALG produces  $\omega$ 3 integrators from the microalga *Schizochytrium*

Among the players to be monitored GELYMA produces anti-aging products from the brown alga *Padina pavonica*

## PHARMACEUTICALS

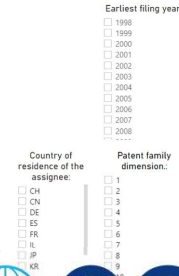
## NUTRACEUTICALS

Nr. of filing events partitioned according to the earliest filing year (EP and PCT not included):

earliest\_filing\_year ● 1951 ● 1985 ● 1986 ● 1990 ● 1993 ● 1996 ● 1997 ● 1998 ● 1999 ● 2000 ● 2001 ● 2002 ● 200



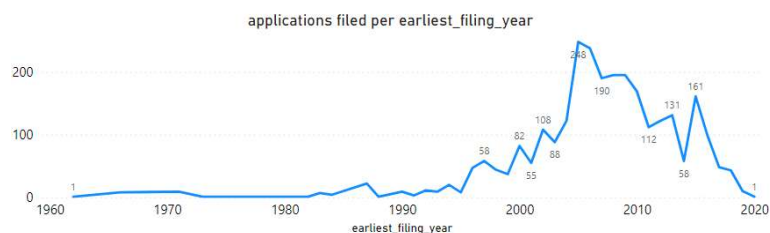
Figure 59 Nutraceuticals: Ranking of the country of residence of the players based on the patent family dimension



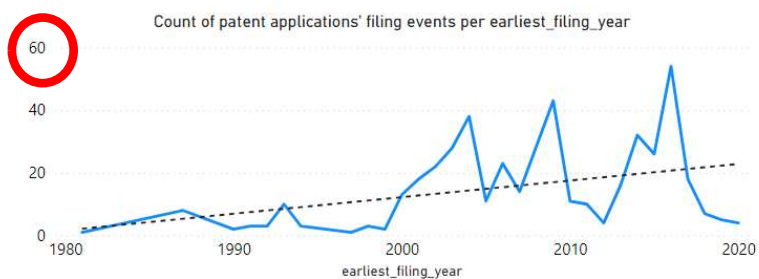


## NORMALIZATION OF PATENT APPLICATIONS

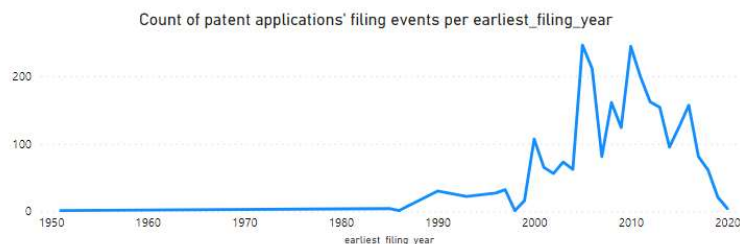
Cosmetics



Pharmaceutics



Nutraceuticals



Patent trends	Market trends
↓	↑
↔	↑
↔	↑

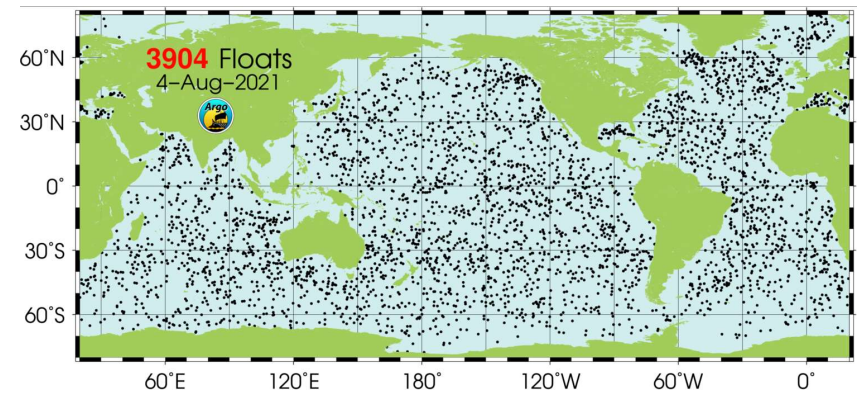
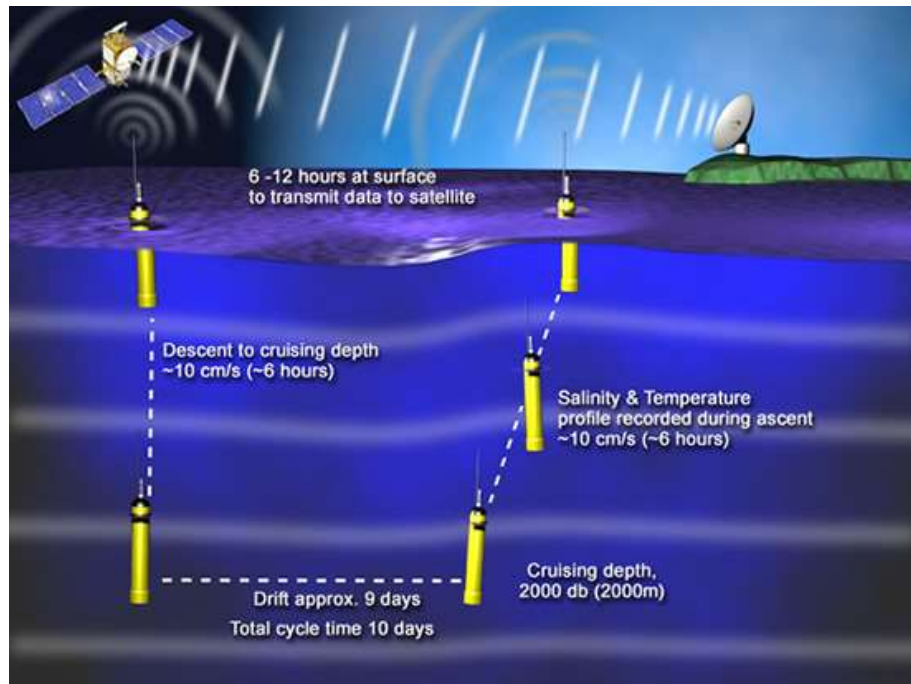


## II. THE BLUE BIOTECHNOLOGY SECTOR

	BBM subsectors	Technologies investigated in the TF	Patent trends	Market trends
2. Blue biotechnology	Industrial Processes and Manufacturing	Sea Organisms Genetics	↔	🌟
		Cosmetics	↓	↑
	Healthcare and Pharmaceuticals	Pharmaceutics	↔	↑
		Nutraceuticals	↔	↑
	Agriculture, Livestock, Food processing	Soil fertilization	↓	↑
	Biofuels	Biofuels	↓	↑
	Bio-monitoring and bio-remediation	Seawater purification	↔	🌟
		Remediation	↔	🌟

### III. BLUE SUSTAINABLE DEVELOPMENT

## UNMANNED UNDERWATER VEHICLES & SEAWATER SENSORS



## UNMANNED UNDERWATER VEHICLES

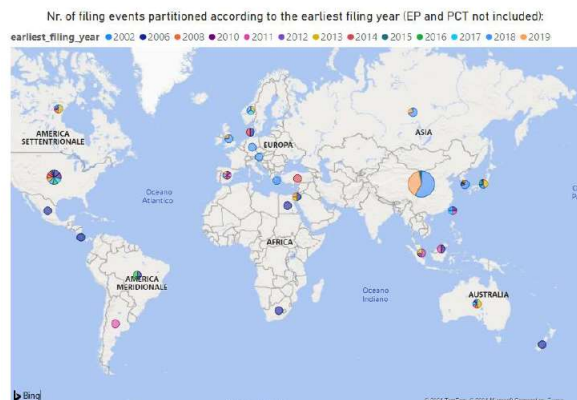
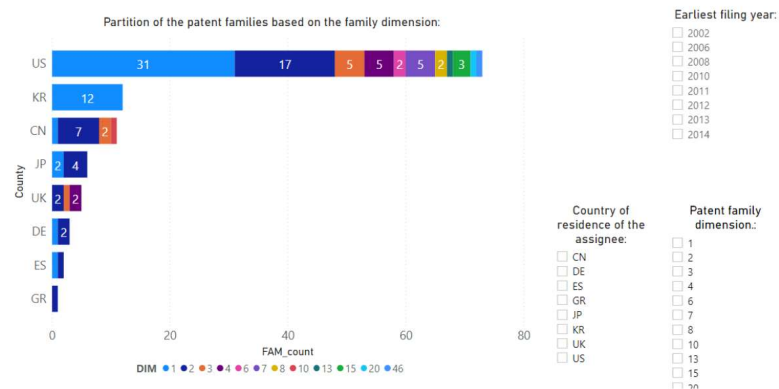


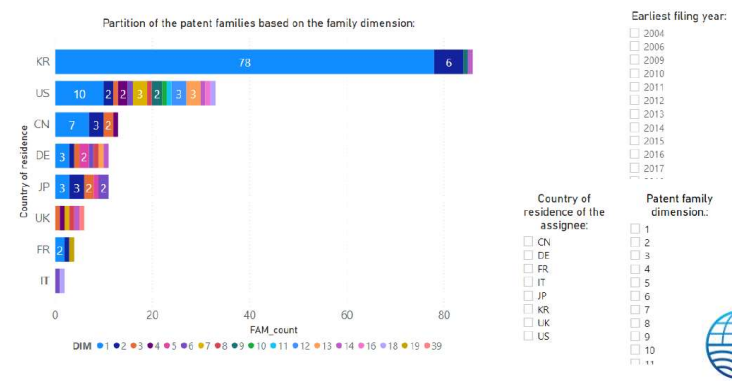
Figure 38 UUV: Ranking of the country of residence of the players based on the patent family dimension



## SEAWATER SENSORS



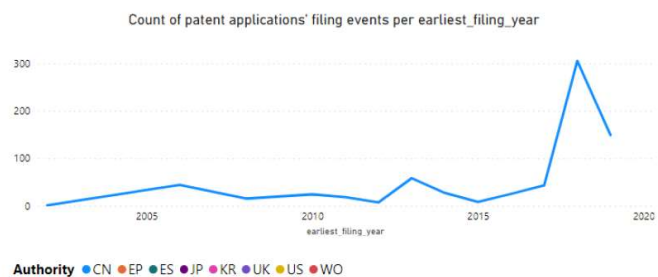
Figure 34 Seawater sensors: Ranking of the country of residence of the players based on the patent family dimension





## UNMANNED UNDERWATER VEHICLES

Figure 20 Normalization of patent applications



## SEAWATER SENSORS



### Technologies investigated in the TF

UUV  
 Seawater sensors

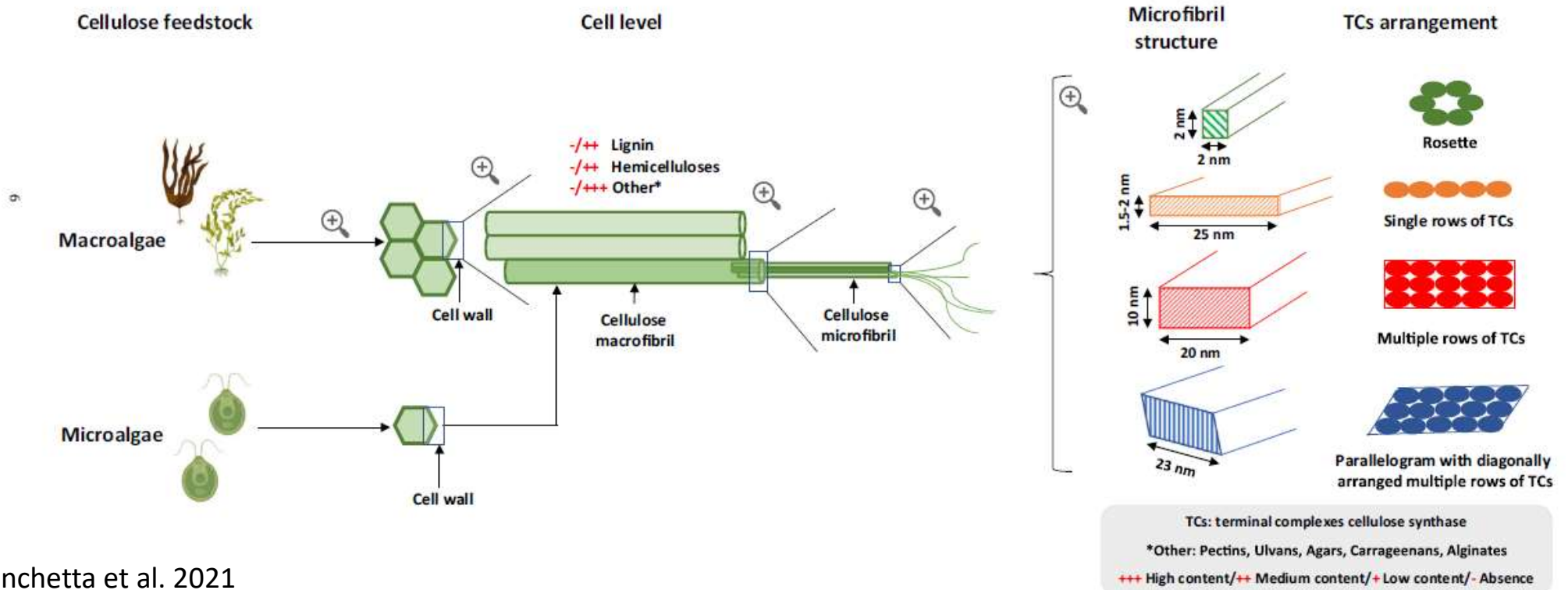
Patent trends



Market trends



## BIOPLASTICS



### 5.c PLAYERS TO BE MONITORED

- CARBIOS ([Carbios - Innovating for a true circular economy in plastics](#))
- CARBIOLICE ([Carbiolice ≡ Compostable plastic solutions](#))
- CABAMIX ([CABAMIX, producer of CARBOMAX and CARBOMAX BIO, calcium carbonate base additive](#))
- VALAGRO CARBONE RENOUVELABLE POITOU ([Home - Valagro Research and Development \(valagro-rd.com\)](#))
- PATENT SHOES S.L. ([Patent Shoes – Science for design \(patent-shoes.com\)](#))
- ADERCARTA SpA ([Carte e sacchetti alimentari | Adercarta](#))
- MIXCYCLING Srl ([Mixcycling srl - Brand di design Italy | Fuorisalone.it](#))
- BIOLOGIQ ([BioLogiQ](#))
- DANIMER BIOPLASTICS ([Home - Danimer Scientific](#))
- TETHIS ([Home \(tethis.com\)](#))
- HOPE TREE INTERNATIONAL GmbH ([Hope Tree International GmbH - Umwelteinrichtung Für Erneuerbare Natürliche Ressourcen in Holzkirchen \(business.site\)](#))
- SPC SUNFLOWER PLASTIC COMPOUND ([SPC-Biopolymere](#))
- PORVAIR SCIENCES ([Porvair Sciences Limited](#))
- SOLUBLUE ([SoluBlue - The Clear Alternative to Plastic Packaging](#))
- DOIL ECOTEC ([Doil Ecotec Co., Ltd.](#))
- ALCHEMYTH ([Alkermis \(alchemyth.com\)](#))
- OMYA ([Welcome to Omya](#))
- PAPTIC ([Sustainable Alternative to Plastic Materials in Packaging - Paptic](#))

Figure 110 Bioplastics: Map of national/supranational patent authorities

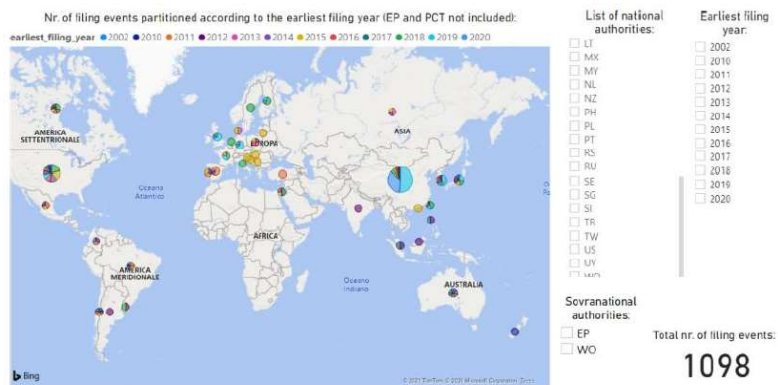


Figure 111 Bioplastics: Normalization of patent applications

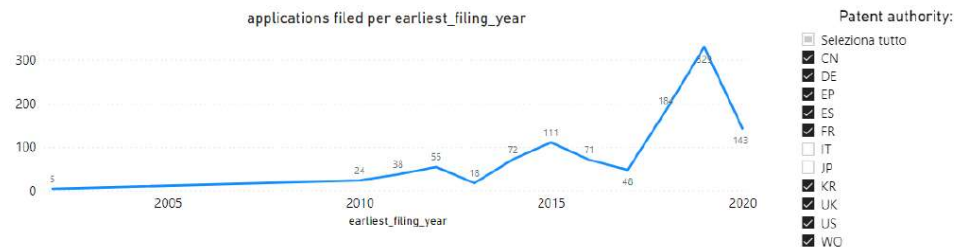
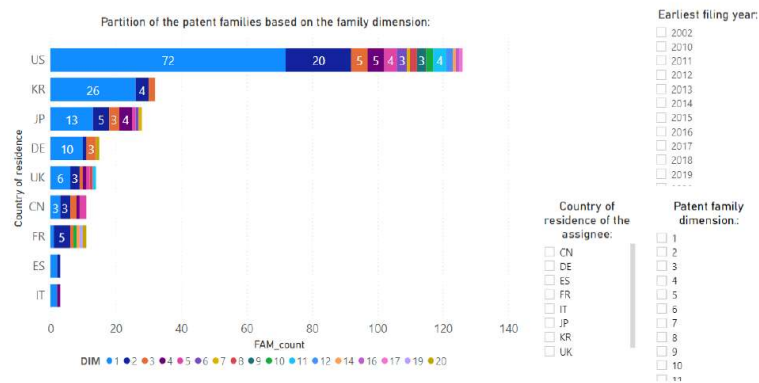


Figure 121 Bioplastics: Ranking of the country of residence of the players based on the patent family dimension



Technologies investigated in the TF

Bioplastics

Patent trends  
↑

Market trends  
↑



### III. BLUE SUSTAINABLE DEVELOPMENT

BBM subsectors		Technologies investigated in the TF	Patent trends	Market trends
3. Blue sustainable development	a. Monitoring and Observing systems for Marine Environment	Marine mapping	↔	↔
		Maritime surveillance	↑	↔
		UUV	↑	↑
		Seawater sensors	↑	↔
	b. Marine Environmental Technologies	Precision aquaculture	↑	↑
		Microplastics	↔	↔
	c. Methods and tools for the preservation and management of marine ecosystem, reduction of	Bioplastics	↑	↑

**THANK YOU FOR YOUR ATTENTION!**  
**[mcelussi@ogs.it](mailto:mcelussi@ogs.it)**